

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper 74

Interference Trial Section Merits Panel
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

ROLF L. GEERTS and TARA G. HILL,¹
Junior Party
(Patent 5,414,180),

v.

TOSHIHIKO SUGANO and TOMOHIKO TAKAHAMA,²
Senior Party
(Application 08/887,265).

Patent Interference No. 104,132

Before: SCHAFER, LEE and TORCZON, Administrative Patent Judges.

SCHAFER, Administrative Patent Judge.

FINAL JUDGMENT

We award judgment against Geerts.

¹ Application 08/092,143, filed July 14, 1993, issued as Patent 5,414,180, May 9, 1995.

² Application 08/887,265, filed July 2, 1997, said to be a continuation of application 08/422,322, filed April 13, 1995, said to be a continuation of application 08/161,464 filed December 6, 1993, issued as Patent 5,449,650. The applicants claim the benefit of Japanese applications 4-328211 and 4-328225, both filed December 8, 1992.

We hold (1) that certain activities attributable to Geerts give rise to an inference that Geerts suppressed or concealed the invention, (2) that work on the invention was renewed prior to Sugano's entry into the field and (3) that Geerts has failed to prove reasonable diligence from prior to Sugano's entry into the field to the filing of Geerts' involved application.

Finding of Facts

The following findings are supported by a preponderance of the evidence:

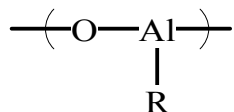
The parties

1. This interference is between Patent 5,414,180 issued to Geerts and Application 08/887,265 filed by Sugano.
2. The real-parties-in-interest are of Phillips Petroleum Company (Phillips) for the Geerts Patent and Mitsubishi Petrochemical Company, Ltd. for Sugano. Paper 6, p. 1; Paper 2, p. 2.
3. The Geerts patent issued from Application 08/092,143, filed July 14, 1993.
4. Sugano's involved application was filed on July 2, 1997, and was accorded the benefit for purpose of priority of application 08/422,322, filed April 13, 1995; application 08/161,464, filed December 6, 1993, and Japanese applications 4-328211 and 4-328255, both filed December 8, 1992.
5. Sugano is the senior party by virtue of the December 8, 1992, benefit date of the Japanese applications.

The subject matter of the interference

6. The parties' inventions relate to organic aluminoxy compounds said to be useful as part of a catalyst system for polymerizing olefins.
7. Olefins are hydrocarbon compounds having a single double bond which may be described by the empirical formula C_nH_{2n} . Ethylene, C_2H_4 and propylene, C_3H_6 , are examples of olefins.
8. Olefin molecules may be combined or "polymerized" into long chain molecules called polyolefins. Polyethylene and polypropylene are examples. Many common plastics are made of polyolefins.
9. Polyolefins are made from olefins by a reaction using a polymerization catalyst system.
10. One type of olefin polymerization catalyst system is a mixture of an aluminoxane and certain metallocenes.
11. The aluminoxane in the catalyst system is often referred to as a co-catalyst.

12. An aluminoxane is an oligomeric organic aluminoxy compound. Geerts' specification describes aluminoxanes as compounds having repeating units of the formula:

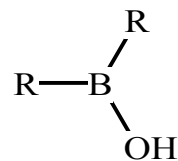
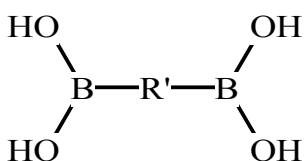
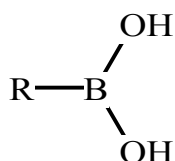


R in the formula is a hydrocarbyl group. GX 1, col. 3, lines 19-26.

13. Geerts' specification describes that aluminoxanes were most commonly produced by hydrolysis an alkyl aluminum compound. GX 1, col. 1, lines 25-29.

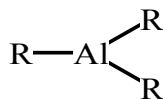
14. The aluminoxy compounds of the parties' invention are the reaction product of a hydrocarbyl boronic acid with an organo aluminum compound.

15. The hydrocarbyl boronic acid compounds have one of the following structural formulas:



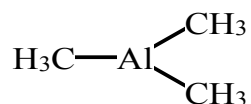
16. "R" in the above formulas is a monovalent hydrocarbyl radical and "R'" is a divalent hydrocarbyl radical.

17. The organo aluminum compound may be a trihydrocarbyl aluminum compound. Such compounds have the following structural formula:



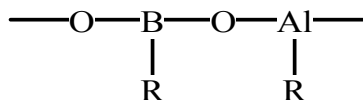
18. "R" in the above formula represents a hydrocarbyl.

19. Trimethylaluminum is a trihydrocarbyl aluminum compound. Trimethylaluminum may be represented by the following formulas: $(\text{CH}_3)_3\text{Al}$, Me_3Al , AlMe_3 or



“Me” represents a methyl (-CH₃) group.

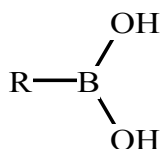
20. According to Geerts’ specification, depending on the relative amounts of boronic acid and trihydrocarbyl aluminum, the resulting product may be a conventional aluminoxane compound as described above or a compound including the following structure:



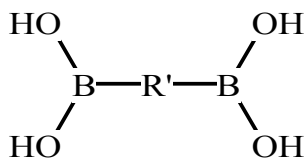
GX 1, col. 3, lines 5-26.

21. Claim 1 of Geerts’ patent provides:

1. A process for preparing a hydrocarbyl aluminoxy composition comprising reacting a hydrocarbyl boron compound having boron acid functionality with a trihydrocarbyl aluminum compound under suitable reaction conditions, said hydrocarbyl boron compound being selected from the group consisting of monoboronic acids of the formula

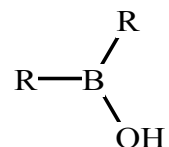


wherein R is a monovalent hydrocarbyl radical, diboronic acids of the formula



wherein R' is a divalent hydrocarbyl radical, and hydrocarbyl boronic acids of the formula R₂B(OH) wherein each R is a hydrocarbyl radical.

22. $R_2B(OH)$ is the same compound depicted in ¶ 15 above as



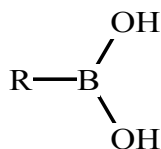
23. Claim 2 of Sugano's application is:

2. A catalyst component for the polymerization of olefins, comprising a boron-containing reaction product of the following sub-components (I) and (ii):

sub-component (I) which is a compound having the formula $R^1-B(OH)_2$ in which R^1 is a hydrocarbon radical having 1 to 10 carbon atoms or a halogen-containing hydrocarbon radical having 1 to 10 carbon atoms; and

sub-component (ii) which is an organoaluminum compound.

24. $R^1-B(OH)_2$ is the same compound depicted in ¶ 15 above as



25. The count is

Claim 1 of Geerts patent 5,414,180 or Claim 2 of Sugano application 08/887,265.

Paper 42, p. 4.

Actual Reduction to Practice

26. Geerts alleges a number of actual reductions to practice of an embodiment within the count between March 1989 and September 1990. Paper 62, pp. 20-31.

27. Sugano does not challenge Geerts' actual reductions to practice between March 1989 and September 1990. Paper 63, pp. 4-5.

Phillips' Patent Procedures

28. Phillips employees are encouraged to complete a "Patent Idea Record" form to memorialize ideas for new products or processes. GR 8-9³, ¶ 4.
29. Completed Patent Idea forms are given sequential "PI" numbers as they are received by personnel in Phillips Patent Department. GR 9, ¶ 4; GR 413, ¶¶ 4-5
30. After assignment of a PI number, the Patent Idea is assigned to a patent liaison. GR 9, ¶ 5; GR 413-14, ¶ 5
31. The patent liaison performs an initial patentability evaluation of the invention which may involve discussion and correspondence with the inventor and a prior art search. GR 9, ¶ 5; GR 414, ¶¶ 6-7.
32. Once the liaison is satisfied that an idea is sufficient to proceed towards filing a patent application, an Invention Number (IN) is assigned, the inventors are informed that the idea was sufficiently meritorious to be submitted to the Phillips Invention Committee, and the case is transferred to a patent attorney with a written recommendation on patentability. GR 9, ¶ 5; GR 414, ¶ 7.
33. The patent attorney presents the invention to the invention committee for their consideration. GR 10, ¶ 6; GR 415, ¶ 9.
34. The Invention Committee meets about once a month and decides whether a patent application should be filed on the invention. Sequential Case Numbers are assigned to inventions for which applications are to be filed and the case is placed on an attorney's docket. GR 10, ¶ 7; GR 415, ¶ 9.
35. Phillips' Patent Department policies specify that patent application preparation be taken up in the order that they are assigned to an attorney's docket. GR 10, ¶ 8.

Preparation and Processing of Patent Idea Records

Patent Idea Record 13910

36. On January 31, 1989, Dr. Rolf Geerts prepared a Patent Idea Record that was subsequently assigned No. 13910 (PI 13910). GR 221, ¶ 72; GR 415 ¶ 10.

³ "GR" refers to Geerts' record. The number following GR indicates the page in the record.

37. PI 13910 describes, inter alia, the reaction of trimethylaluminum ((CH₃)₃Al) with methyl boronic acid in toluene to obtain a co-catalyst which may be reacted with a transition metal to obtain a catalyst capable of polymerizing ethylene and other 1-olefins. GX⁴ 4.

38. A letter dated October 24, 1989, informed Dr. Geerts that PI 13910 had sufficient merit to be presented to the Invention Committee and that Invention Number 14546 (IN 14546) was assigned to the idea. GR 13, ¶ 16; GR 417, ¶ 15; GX 37.

39. On May 7, 1992, IN 14546 was transferred from the patent liaison to patent attorney Edward L. Bowman. GR 13, ¶ 17; GX 59.

40. Almost 31 months passed between the date of the letter to Dr. Geerts and transfer of IN 14546 to the patent attorney.

41. Geerts provides no explanation for why IN 14546 was not promptly forwarded to a patent attorney for further evaluation.

42. On May 22, 1992, the Phillips Invention Committee decided that an application should be filed on IN 14546, which was assigned Case Number 33136 (Case 33136). GR 14, ¶ 18; GX 59.

Patent Idea Record 14114

43. On June 1, 1989, Dr. Geerts prepared a Patent Idea Record that was subsequently assigned PI 14114. GR 15, ¶ 20; GR 227, ¶ 92; GR 417, ¶ 16; GX 7.

44. PI 14114 describes the reaction of trimethylaluminum (AlMe₃) and methyl boronic acid (MeB(OH)₂) to form a co-catalyst which is mixed with a metallocene, cyclopentadienyl zirconium dichloride (Cp₂ZrCl₂), to yield an ethylene polymerization catalyst. The catalyst is said to produce polyethylene with “good particle form.” The catalyst was also said to have a polyethylene productivity of 8300 gm P.E./gm catalyst • hr. GX 7.

45. A letter dated October 24, 1989, informed Dr. Geerts that PI 14114 had sufficient merit to be presented to the Invention Committee and that IN 14545 was assigned to the idea. GR 15, ¶ 21; GR 418, ¶ 21; GX 40.

46. On May 7, 1992, IN 14545 was transferred from the patent liaison to patent attorney Bowman. GR 15, ¶ 22; GX 61.

47. Almost 31 months passed between the date of the letter to Dr. Geerts and transfer of IN 14545 to the patent attorney.

48. Geerts provides no explanation for why IN 14545 was not promptly forwarded to a patent attorney for further evaluation.

49. On May 22, 1992, the Phillips Invention Committee decided that an application should be filed on IN 14545 but that the invention should be part of Case 33136. GR 15-16, ¶ 23, GX 61.

Patent Idea Record 14115

50. On June 1, 1989, Dr. Geerts prepared a Patent Idea Record that was subsequently designated PI 14115. GR 16, ¶ 25; GR 225, ¶ 85; GR 418, ¶ 22; GX 6.

51. PI 14115 describes the reaction of a 1:1 ratio of trimethylaluminum and methylboronic acid to yield a solid and reacting the resulting solid with a metallocene (Cp_2ZrCl_2 - cyclopentadienyl zirconium dichloride) to form a supported catalyst. The catalyst along with a trimethylaluminum co-catalyst was said to polymerize ethylene to polyethylene with a productivity of 52,000 gm P.E./gm catalyst • hr. The catalyst was also said to produce polyethylene with “very good particle form.” GX 6.

52. A letter dated October 24, 1989, informed Dr. Geerts that PI 14115 had sufficient merit to be presented to the Invention Committee and that IN 14544 was assigned to the idea. GR 17, ¶ 26; GR 420, ¶ 27; GX 43.

53. On May 6, 1992, IN 14544 was transferred from the patent liaison to patent attorney Bowman. GR 17, ¶ 27; GX 63.

54. Almost 31 months passed between the date of the letter to Dr. Geerts and transfer of IN 14544 to the patent attorney.

55. Geerts provides no explanation for why IN 14544 was not promptly forwarded to a patent attorney for further evaluation.

56. On May 22, 1992, the Phillips Invention Committee decided that an application should be filed on IN 14545 but that the invention should be part of Case 33136. GR 15-18, ¶ 28, GX 63.

Patent Idea Record 14973

57. On April 20, 1990, Dr. Geerts prepared a Patent Idea Record that was subsequently designated PI 14973. GR 18, ¶ 30; GR 234, ¶ 109; GR 337, ¶ 15; GR 420, ¶ 28; GX 9.

58. PI 14973 describes the formation of a supported catalyst by reacting MeB(OH)_2 with an alumina or silica support material in a solvent and drying to obtain a powder. The powder is suspended in toluene and Me_3Al is added in a prescribed ratio of Al to B. After the reaction is complete, a specified amount of Cp_2ZrCl_2 is added and the mixture is dried to obtain a free flowing solid. The solid is said to be an active catalyst for alpha-olefins without the need of an additional co-catalyst. GX 9.

59. A letter dated February 13, 1991 informed Dr. Geerts that PI 14973 had sufficient merit to be presented to the Invention Committee and that IN 15174 was assigned to the idea. GR 18, ¶ 31; GR 421, ¶ 31; GX 45.

60. On May 13, 1992, IN 15174 was transferred from the patent liaison to patent attorney Bowman. GR 19, ¶ 32; GX 45.

61. Almost 15 months passed between the date of the letter to Dr. Geerts and transfer of IN 15174 to the patent attorney.

62. Geerts provides no explanation for why IN 15174 was not promptly forwarded to a patent attorney for further evaluation.

63. A letter dated July 7, 1992, informed Dr. Geerts that filing a patent application on IN 15174 was not warranted “because of insufficient patent value in its present state of development.” GR 19, ¶ 33; GR 326-27, ¶ 9; GX 66.

64. On June 18, 1993, the Phillips Invention Committee decided that an application should be filed on IN 15174 but the filing would be part of Case 33136. GR 23-24, ¶ 45; GX 65.

Patent Idea Record 16876

65. On June 26, 1992, Drs. Geerts and Hill prepared a Patent Idea Record that was subsequently designated PI 16876. GR 20, ¶ 35; GR 306, ¶ 371; GR 364, ¶ 29; GX 27.

66. PI 16876 describes the formation of ethylaluminumoxane by the reaction of triethylaluminum and methylboronic acid in a hydrocarbon solvent and indicates that the soluble product can be used as an olefin polymerization catalyst. GX 27.

67. A letter dated September 22, 1992, informed Drs. Geerts and Hill that PI 16876 had sufficient merit to be referred to the Phillips Invention Committee and that IN 15622 had been assigned to the idea. GR 36-37, ¶ 19; GR 20, ¶ 36; GX 57.

68. On September 29, 1992, IN 15622 was transferred from the patent liaison to patent attorney Bowman. GR 20-21, ¶ 37; GR 22-23, ¶ 42, GX 67.

69. The time period between the letter to Drs. Hill and Geerts and transferring IN 15622 to a patent attorney was 7 days.

70. On October 21, 1992, the Phillips Invention Committee decided that an application should be filed on the invention described in IN 15622 but that it should be part of Case 33136. GR 21, ¶ 38; GX 67.

The Boroxine Work

71. After September, 1990, while matters were pending with the patent liaison, Geerts began work a different way of making organo-aluminox co-catalysts. This method employed the reaction of an aluminoxane with an organo boroxine. GR 205-206, ¶ 21-22.

72. Case Number 33120 was assigned to the boroxine invention. GR 27, ¶ 54.

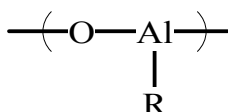
73. The boroxine work resulted in the filing of application 08/373,129 on February 12, 1993, and a divisional application January 17, 1995. These applications matured into U.S. Patent 6,005,061. GR 205-206, ¶ 21; GR 325, ¶ 5; GX 83; GX 2.

74. The 061 patent is not an involved patent in this interference or relied upon for benefit.

75. The 061 patent is of record as GX 2.

76. The work described in the 061 patent relates to the formation of a cocatalyst by the reaction of an organo aluminoxane with an organo boroxine compound. Paper 62, p. 133-134; GX 2, col. 2, lines 29-33.

77. The organo aluminoxanes referred to in the 061 patent are said to be compounds including a multiplicity of the following groups:



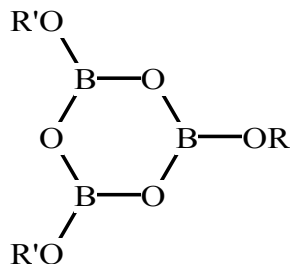
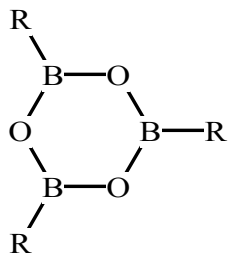
R in the formula represents a hydrocarbyl group. GX 2, col. 1, lines 4-15.

78. The 061 patent says that aluminoxanes may be formed “by the partial hydrolysis of hydrocarbyl aluminum compounds.” GX 2, col. 1, lines 22-23.

79. No other method of making an aluminoxane is described in the 061 patent.

80. The 061 patent describes organo boroxines as compounds represented by the formulas $(RBO)_3$ and $((R'O)BO)_3$ where R and R' are hydrocarbyl groups. GX 2, col. 4, lines 16-40.

81. These boroxines may be represented by the following structural formulas:



82. Dr. Geerts testifies that the invention of the 061 patent

was an integral part of my continuing research effort aimed at developing co-catalysts and catalyst composites for polymerizing olefins. . . . [T]he work that led to the '061 patent was, in my mind, a progression of the research described above directed to finding new aluminoxane co-catalysts and new ways of making aluminoxane co-catalysts.

GR 205-06, ¶ 21.

83. Commercial methylaluminoxane (MAO) is said to be a source of aluminoxane used in the boroxine work. GR 278, ¶ 271.

84. Commercial MAO is said to contain significant amounts of trimethylaluminum. GR 278, ¶ 271.

85. Dr. Geerts testifies that between September 23, 1991, and September 26, 1991, he did some experiments to determine if the trimethylaluminum present in commercial MAO could be converted to MAO without impairing the usefulness of the MAO already in the mixture. GR 278, ¶¶ 271-72.

86. In the experiment, Geerts attempted to react the trimethylaluminum present in commercial methylaluminoxane solution with boronic acid. A reaction was said to take place. The reaction mixture was said to have been reacted with methoxyboroxine to form a precipitate which was used to make a catalyst. GR 278-79, ¶¶ 271-274; GX 16, p. 86.

87. The process of converting trimethylaluminum present in commercial MAO prior to precipitation with borxine described in the preceding ¶ 86 is not described in Geerts' involved patent.

88. The processes for making the co-catalysts according to the invention of the count and that used in the boroxine work are different. Compare Finding of Facts ¶¶ 14 and 80.

89. None of the boroxine work appears in Geerts' involved patent.

90. No reference to making aluminoxanes by reacting trihydrocarbyl aluminum with boronic acid is present in the 061 patent.

91. No technical information from the boroxine experiments which facilitates the practice of the invention of the count has been identified.

92. The boroxine work has not been shown to be closely related to the invention of the count.

93. The boroxine work and the invention of the count are significantly different.

Activities in June 1992

94. Drs. Geerts and Hill testified that Dr. Hill made ethylaluminoxane by reacting triethylaluminum with methylboronic acid in June 1992. GR 359-361, ¶¶ 17-21; GR 305, ¶ 369; GX 26, pp. 10-11.

95. Drs. Geerts and Hill testified that they prepared Patent Idea Record reporting this work. GR 364, ¶ 29; GR 306, ¶ 371.

96. The report is said to have subsequently been given PI # 16876 by the Phillips Patent Department. GR 364, ¶ 29; GR 306, ¶ 371; GR 60-61, ¶ 15.

97. A copy of the form is of record as GX 27. GR 364, ¶ 29; GR 306, ¶ 371; GR 61, ¶ 15.

98. Harold R. Deck testified that he read and signed the form on June 26, 1992. GR 60-61, ¶ 15.

Processing of Case 33136

99. Case Number 33136 was placed on the docket of patent attorney Edward L. Bowman, Phillips Senior Patent Counsel, for preparation and filing of a patent application on May 22, 1992. GR 14, ¶ 18.

100. Bowman, drafted and prosecuted the Geerts application that issued as the Geerts involved patent. GR 12, ¶ 12.

101. Case Number 33136 was ultimately filed as application 08/092,143, on July 14, 1993, and matured into Geerts' involved patent. GR 24, ¶ 47.

102. Bowman testifies that he had a heavy case load between May 22, 1992 and August 31, 1993. GR 22, ¶ 42; GR 24, ¶ 48.

103. Bowman also testifies that he was responsible for drafting infringement and validity opinions during this time. GR 24, ¶ 48.

104. Bowman testified that he follows the Phillips policy of preparing patent applications in the order assigned, but that extenuating circumstances may arise that require that an application be prepared out of sequence, such as when an application needs to be filed to avoid a statutory bar date. GR 11, ¶ 9.

105. Bowman testifies that he took up cases in the order in which they were assigned to him. GR 22, ¶ 42; GR 25, ¶ 49.

106. Bowman refers to GX 69 and 70 which are said to be a report of the applications and responses he filed with the PTO between May 22, 1992, and August 31, 1993. GR 24, ¶ 48.

107. Bowman notes that GX 69 indicates that not all applications were filed in the sequence indicated by the docket or case numbers and that a number of the applications on the list are exceptions to Phillips' sequential filing policy. GR 25, ¶ 49.

108. Bowman also testifies that ten of the applications listed on GX 69 were continuations, continuations-in-part or divisionals and that the deadlines for filing those applications are usually controlled by PTO response deadlines. GR 25, ¶ 50.

109. Bowman states that eight of the applications listed on GX 69 were original Canadian applications and that deadlines for filing are controlled by the filing of U.S. counterpart applications. GR 25, ¶ 50.

110. Bowman does not recall specific details of his work on preparing and filing Case 33136. Bowman testified:

(1) "I do not recall any specific details of my efforts to prepare and ultimately file Case Number 33136 (the Phillips case that issued as the Geerts '180 patent)." GR 22, ¶ 40.

(2) "I probably did not begin any preliminary work on Case 33136 for at least several months after the Invention Committee's decision regarding IN 15174." GR 22, ¶ 42.

(3) "I believe that I conducted preliminary work on Case 33136 starting after October 1992." GR 23, ¶ 43. .

(4) “I believe that I began drafting Case 33136, following the ordinary sequence of cases appearing on my docket, sometime in early to mid 1993.” GR 23, ¶ 44.

111. Exhibits GX 69 and GX 70 do not indicate when specific work was done on the cases assigned to Bowman.

112. Bowman provides no details showing that deadlines necessitated that the cases be taken out of sequence.

113. Bowman does not provide any specific details as to when work was actually done on the specific cases assigned to him.

114. Bowman testified that during the period from May 22, 1992, to August 31, 1993, he also worked on an application (Case 33120) said to be closely related to the invention of the count and that much of the work on that case carried over to Case 33136. GR 27, ¶ 54.

115. Bowman does not explain how Case 33120 and 33136 are closely related or how the work on 33120 substantially contributed to the preparation of the 33136.

Discussion

A.

Sugano does not challenge that Geerts was the first to actually reduce the invention to practice between March 3, 1989, and September 7, 1990. Notwithstanding Geerts earlier reductions to practice, Sugano asserts that judgment should be awarded against Geerts because Geerts should be held to have suppressed or concealed the invention. Paper 63, p. 4.

B.

The case law identifies two types of suppression or concealment, intentional and inferred. Apotex USA, Inc. v. Merck & Co. Inc., 254 F.3d 1031, 1038, 59 USPQ2d 1139, 1144 (Fed. Cir. 2001); Fujikawa v. Wattanasin, 93 F.3d 1559, 1567, 39 USPQ2d 1895, 1901 (Fed. Cir. 1996). The first involves the situation where an inventor or his assignee actively or deliberately suppresses or conceals the invention from the public. Apotex, 254 F.3d at 1038, 59 USPQ2d at 1144; Fujikawa, 93 F.3d at 1567, 39 USPQ2d at 1901 (citing Kendall v. Winsor, 62 U.S. 322, 328 (1858)). The second involves a legal inference of suppression or concealment because of an unreasonable delay in filing a patent application. Apotex, 254 F.3d at 1038, 59 USPQ2d at 1144; Paulik v. Rizkalla, 760 F.2d 1270, 1273, 226 USPQ 224, 226 (Fed. Cir. 1985) (in banc); Peeler v. Miller, 535 F.2d 647,

655, 190 USPQ 117, 122 (1976) (a four-year delay in filing a patent application after the invention was perfected was unreasonably long); Shindelar v. Holdeman, 628 F.2d 1337, 1342, 207 USPQ 112, 116 (1980) (holding suppression or concealment because no reasonable explanation was given for the two-year and five-month delay between reduction to practice and the filing of a patent application). Sugano does not allege intentional suppression or concealment, so only inferred suppression or concealment is at issue here.

In Correge v. Murphy, 705 F.2d 1326, 1330, 217 USPQ 753, 756 (Fed. Cir. 1983) (quoting International Glass Co. v. United States, 408 F.2d 395, 403, 159 USPQ 434, 441 (Ct. Cl. 1968)), the court held:

The courts have consistently held that an invention, though completed, is deemed abandoned, suppressed, or concealed if, within a reasonable time after completion, no steps are taken to make the invention publicly known. Thus, failure to file a patent application; to describe the invention in a publicly disseminated document; or to use the invention publicly, have been held to constitute abandonment, suppression or concealment.

There is no per se period which constitutes a “reasonable time” or “unreasonable time” with regard to an inference of suppression or concealment. Indeed, the time elapsed is not the controlling factor. Rather, it is the total conduct of the first inventor. Fujikawa, 93 F.3d at 1567, 39 USPQ2d at 1902, citing Young v. Dworkin, 489 F.2d 1277, 1285, 180 USPQ 388, 395 (CCPA 1974) (Rich, Judge, concurring). The circumstances surrounding the first inventor’s delay and the reasonableness of that delay are important facts which must be considered. Fujikawa, 93 F.3d at 1567, 39 USPQ2d at 1902. The total conduct of the first inventor includes the inventor's activities during the delay period (e.g., he may have worked during that period to refine or perfect the invention disclosed in the patent application); Lutzker v. Plet, 843 F.2d 1364, 1367, 6 USPQ2d 1370, 1372 (Fed. Cir. 1988); Horwath v. Lee, 564 F.2d 948, 952, 195 USPQ 701, 705 (CCPA 1977); Young, 489 F.2d at 1281 n.3, 180 USPQ at 391-92 n.3; Frey v. Wagner, 87 F.2d 212, 215, (CCPA 1937) ("The law does not punish an inventor for attempting to perfect his process before he gives it to the public."). However, where the delay is due to work on refinements or improvements which are not reflected in the final patent application, the delay will not be excused. Lutzker, 843 F.2d at 1367, 6 USPQ2d at 1372 ; Horwath, 564 F.2d at 952, 195 USPQ at 706. The total conduct of the inventor also includes the activities of other employees of the inventor’s assignee, such as the assignee’s patent department.

Thus, an unreasonable or unexplained delay in preparing a patent application by the assignee's patent department may be a basis to infer suppression or concealment. Accord, Paulik, 760 F.2d at 1271-72, 226 USPQ at 224-25 (Evidence of resumed activity after suppression or concealment due to a four year delay by patent department in preparing application but before opponent's effective date must be considered as evidence of priority.)

A party who has been held to have suppressed or concealed a invention may still prevail on priority if the evidence establishes (1) renewed activity on the invention before the opponent's entry into the field and (2) that the party proceeded diligently to file the application beginning from a time before the opponent's entry into the field. Lutzker, 843 F.2d at, 1367, 6 USPQ2d at 1372; Paulik, 760 F.2d at 1272, 226 USPQ at 225.

C.

Geerts asserts at least eleven actual reductions to practice between November, 1988, and September, 1990. Paper 62, pp. 6-7, 20-31 and 121-123. The Geerts application was filed July 14, 1993. Sugano asserts that the Geerts should be held to have suppressed or concealed the invention

because Geerts effectively shelved the invention corresponding to the count for nearly 34 months between the time Geerts completed a series of lab activities reducing the subject matter of the count to practice by September 1990 and the time an application for the subject matter of the county was filed in July 1993.

Paper 63, p. 2.

We hold that the 34 month delay after completion of at least eleven actual reductions to practice provides a sufficient basis to consider whether Geerts should be held to have suppressed or concealed the invention. Thus, it is appropriate for us to look at Geerts' total conduct during this period. Fujikawa, 93 F.3d at 1567, 39 USPQ2d at 1902.

1.

The record appears to show that Geerts was actively working on the invention from at least as early as December, 1988, until September, 1990. In addition to numerous reductions to practice, Geerts prepared Patent Idea records 13910, 14114, 14115, and 14973 during this period. The patent idea records were submitted by Geerts to the Phillips patent department. In October of 1989 it was determined that PI numbers 13910, 14114, and 14115 had "sufficient merit to be presented to the

Invention Committee for their consideration.” GX 37, GX 40, GX 43. In February of 1991, it was determined that PI 14973 had sufficient merit to be submitted to the Invention Committee. GX 45. The inventions were assigned Invention Numbers (IN) 14546, 14545, 14544 and 15174, respectively. GX 37, GX 40, GX 43, GX 45. Under Phillips’ established invention evaluation procedures, the next step was to transfer the matter to a patent attorney for presentation to the Invention Committee. GR 9, ¶ 5-6; GR 414-15, ¶¶ 7-9. However, the record shows that IN 14546, 14545, 14544 and 15174 were not transferred to a patent attorney until May, 1992. GR 13-14, ¶ 17, GX 59; GR 15, ¶ 22, GX 61; GR 17, ¶ 27, GX 63; GR 19, ¶ 32, GX 65. This is almost 31 months after IN 14546, 14545, and 14544 were approved for evaluation by the Invention Committee and almost 15 months after IN 15174 was approved. During this time progress towards filing an application languished. Geerts has not provided any explanation for this delay. We hold that the unexplained thirty-one and fifteen month periods between the approval for submission to the Patent Committee in October, 1989, and February, 1991, and the assignment to a patent attorney in May, 1992, gives rise to an inference of suppression or concealment.

2.

Geerts attempts to justify the delay in progress on the application with work on an invention said to be closely related to the invention of the count and an additional reduction to practice of the count said to be a refinement of the invention.

a.

Geerts argues that

[t]he time between the Geerts reductions to practice and the filing of an application is fully accounted for by activity in perfecting the invention, in exploring its scope, and in disclosing the results of that work in the patent application.

Paper 62, p. 132. For the period beginning November 1990 and ending in early 1993 Geerts relies on work on an invention characterized as closely related to the invention of the count. This period spans the period of inactivity by Phillips’ patent liaison. Geerts argues:

Beginning in November 1990 and continuing through early 1993, Dr. Geerts and his co-workers extensively researched the closely related subject matter of co-catalysts prepared from aluminoxanes precipitated with a boroxine. This research resulted in a patent application which was filed in February

1993 and matured into U.S. Patent No. 6,005,061 (“the ‘061 patent”) on December 21, 1999.

Paper 62, p. 133 (citations to the record omitted).

After September, 1990, the record shows that Geerts turned his attention to a different way of making organo-aluminox co-catalysts. This method employed the reaction of an aluminoxane with an organo boroxine. The boroxine method is outside the scope of the count. This boroxine work resulted in the filing of application 08/017,207 on February 12, 1993, and divisional application 08/373,129 on January 17, 1995. These applications matured into Patents 5,411,925 and 6,005, 061, respectively.

Geerts provides no explanation why the boroxine work justifies a delay in further evaluation by the Phillips patent department. There had already been substantial work on the invention of the count, including at least eleven reductions to practice. The aluminoxy co-catalysts had been shown to be useful for polymerization. Four patent idea records had been prepared. These ideas had been assigned invention numbers and approved for submission to the Phillips Invention Committee. The evaluation of the invention was ready to move to the next step. Yet the evaluation of the inventions languished with the patent liaison. Geerts provides no explanation nor directs us to any evidence which connects the boroxine work with the delay in evaluating the invention.

Geerts asserts that the boroxine work should excuse the delay because it was a refinement of the invention of the count. Paper 62, p. 8, ¶ 16; p. 32, ¶ 66. Dr. Geerts testified that he considered the boroxine work to be a refinement of the invention of the count. GR 205-206, ¶¶ 21-22. However, the boroxine work is not mentioned in Geerts’ involved patent and, therefore, can not justify the delay in filing. Refinements and improvements which are not reflected in the final patent application can not be used to justify a delay in filing. Lutzker, 843 F.2d at, 1367, 6 USPQ2d at 1372; Horwath, 564 F.2d at 952, 195 USPQ at 706.

In any event, we view the relationship between the boroxine work and the subject matter of the count to be too insubstantial to credit any of the boroxine work to justifying a delay in processing of the invention of the count. We note that testimony of record states that the invention of the count and the boroxine work were closely related. GR 27, ¶ 54; GR 61-62, ¶ 18; GR 364-65, ¶ 30.

However, the testimony is conclusory. No explanation has been provided as to how and why the two inventions are closely related.

Geerts appears to argue that the two inventions are closely related because (1) they both relate to aluminoxane co-catalysts (Paper 62, p. 88, ¶ 242) and (2) the aluminoxane which may result from the invention of the count could be reacted with the boroxine to form a new cocatalyst. (Paper 62, p. 7, ¶ 15). While both are correct, they are insufficient to establish that boroxine work should be credited as work on the subject matter of the count. The inventions are significantly different. First, the processes of making the co-catalysts are entirely different. The invention of the count requires the reaction of trihydrocarbyl aluminum and a boronic acid. The boroxine work relies on the reaction of a boroxine with an aluminoxane. Second, it does not appear from the record that the boroxine work contributed any technical information relevant to the invention of the count. Thus, no information relating to the boroxine work is included in Geerts' involved patent. And no reference to the method of making aluminoxane by the reaction of trihydrocarbyl aluminum and boronic acid is made in the 061 patent. Indeed, in describing how aluminoxane may be made, the 061 patent merely states that "[o]rganic aluminoxanes can be produced by the partial hydrolysis of hydrocarbyl aluminum compounds." GX 2, col. 2, lines 22-23.

b.

During the time evaluation of the invention stagnated in the patent department, Geerts alleges an additional reduction to practice in September of 1991. The alleged reduction to practice was an experiment to determine if the trimethylaluminum (Me_3Al) which is present in commercial methylaluminoxane (MAO) could be reacted with boronic acid to form additional MAO. Geerts characterizes this work as a refinement of the invention.⁵ Paper 62, pp. 49-50, Part "v." ("Additional Refinements Of Co-Catalyst Compositions: Reacting Methylboronic Acid With Trimethylaluminum In MAO Solution"). However, for an improvement or refinement to an invention to excuse a delay the refinement must be reflected in the application. Lutzker, 843 F.2d at 1367, 6 USPQ2d at 1372; Horwath, 564 F.2d at 952, 195 USPQ at 706. Geerts' involved patent does not disclose this "refinement." Thus, the alleged reduction to practice does not excuse the

⁵ We express no opinion on whether this experiment constitutes an actual reduction to practice.

delay. Nor does Geerts explain why the alleged reduction to practice caused a delay in the further evaluation of the invention by the patent department. Lastly, even if it is assumed that the experiment excused the delay as of September, 1991, Geerts has not provided an explanation for the delay in processing of the patent ideas by the patent liaison from then until May of 1992. This inactivity by the patent liaison persisted approximately eight months after the alleged September 1991 actual reduction to practice. Thus, the September 1991 experiment does not justify the lack of progress in evaluating the invention.

3.

Notwithstanding the suppression or concealment, Geerts may be awarded priority if activity on the invention was renewed and Geerts proceeded diligently towards filing an application from a time before Sugano entered the field. Lutzker, 843 F.2d at 1367, 6 USPQ2d at 1372; Paulik, 760 F.2d at 1272, 226 USPQ at 225. On this record, Sugano entered the field on the filing date of its Japanese application, December 8, 1992.

a.

Geerts asserts that activity on the invention was renewed in June of 1992 when Drs. Geerts and Hill are said to have actually reduced the invention to practice. Geerts Brief, pp. 136-38. They testified that Dr. Hill formed ethylaluminumoxane by reacting triethylaluminum with methylboronic acid and that it was recorded in Dr. Hill's lab notebook. GR 359-361, ¶¶ 17-21; GR 305, ¶ 369; GX 26, pp. 10-11. They further testified that they prepared Patent Idea Record reporting this work. GR 364, ¶ 29; GR 306, ¶ 371. The report is said to have subsequently been given Patent Idea Number 16876 by the Phillips patent department. GR 364, ¶ 29; GR 306, ¶ 371; GR 60-61, ¶ 15. A copy of the form is of record as GX 27. GR 364, ¶ 29; GR 306, ¶ 371; GR 61, ¶ 15. Harold R. Deck testifies that he read and signed the form on June 26, 1992. GR 60-61, ¶ 15.

"In order to establish an actual reduction to practice, an inventor's testimony must be corroborated by independent evidence." Cooper v. Goldfarb, 154 F.3d 1321, 1330, 47 USPQ2d 1896, 1903 (Fed. Cir. 1998). However, a "rule of reason" analysis is applied to determine whether an inventor's testimony regarding reduction to practice has been sufficiently corroborated. Cooper, 154 F.3d at 1330, 47 USPQ2d at 1903. The rule of reason requires an evaluation of all pertinent evidence when determining the credibility of an inventor's testimony. Price v. Symsek, 988 F.2d

1187, 1195, 26 USPQ2d 1031, 1037 (Fed. Cir. 1993). Sufficient circumstantial evidence of an independent nature can satisfy the corroboration requirement. Knorr, 671 F.2d at 1373, 213 USPQ at 200. Furthermore, an actual reduction to practice does not require corroboration for every factual issue contested by the parties. See Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456, 1464, 45 USPQ2d 1545, 1551 (Fed. Cir. 1998); Mann v. Werner, 347 F.2d 636, 640, 146 USPQ 199, 202 (CCPA 1965) ("This court has rejected the notion that each individual act in the reduction to practice of a count must be proved in detail by an unbroken chain of corroboration."). However, corroboration must not be based solely on evidence coming from the inventor himself. Reese v. Hurst, 661 F.2d 1222, 1225, 211 USPQ 936, 940 (CCPA 1981); Hahn v. Wong, 892 F.2d 1028, 1032, 13 USPQ2d 1313, 1317 (Fed. Cir. 1989) ("The inventor . . . must provide independent corroborating evidence in addition to his own statements and documents."). The corroboration "may consist of testimony of a witness, other than an inventor, to the actual reduction to practice or it may consist of evidence of surrounding facts and circumstances independent of information received from the inventor." Hahn, 892 F.2d at 1032-33, 13 USPQ2d at 1317; Reese, 661 F.2d at 1225, 211 USPQ at 940.

Geerts' evidence is insufficient to prove an actual reduction to practice in June, 1992. The evidence lacks independent corroboration. We have not been directed to any evidence on this alleged reduction to practice which is independent of information received from the inventors. All of the evidence relied upon is either the testimony of the inventors (Hill GR 359-361, ¶¶ 17-21; Geerts GR 212, ¶¶ 44-45, GR 305, ¶ 369; documents they prepared (Hill notebook, GR 360, ¶ 18, GX 26, pp. 10-12; Patent Idea Record 16876, GR 306, ¶ 371, GR 364, ¶ 29, GX 27) or testimony based upon information obtained directly from the inventors (Deck GR 60-61, ¶¶ 15-16). Deck testified that he read and signed the Patent Idea Record 16876. Deck's testimony only corroborates the existence of Patent Idea Record 16876 on June 26, 1992, the date he testified that he read and signed it. Thus, the evidence is insufficient to show an actual reduction to practice.

b.

However, Patent Idea Record 16876 establishes a conception of the invention by June 26, 1992. The test for conception is whether the inventor had an idea that was definite and permanent enough that one skilled in the art could understand the invention; the inventor must prove his

conception by corroborating evidence, preferably by showing a contemporaneous disclosure. An idea is definite and permanent when the inventor has a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan he hopes to pursue. Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1227-28, 32 USPQ2d 1915,1919 (Fed. Cir. 1994). Patent Idea Record 16876 describes an embodiment including every element of the count. Deck's testimony that he read and signed the document on June 26, 1992, corroborates the conception. This conception constitutes renewed activity on the invention.

c.

The record also establishes renewed activity at least by October 21, 1992, when the Phillips Invention Committee decided that an application should be prepared and filed on Invention No. 15622 and include this invention as part of Case No. 33136. Bowman testifies that the Patent Committee evaluated and approved Invention No. 15622 for filing on that date. GR 21, ¶ 38; GX 67. Invention No. 15622 had been assigned to Patent Idea Record 16876. GR 36-37, ¶ 19; GX 57.

4.

We will now consider whether the record demonstrates reasonable diligence from prior to December 8, 1992, (Sugano's foreign priority date) to the filing of Geerts' application on July 14, 1993. The record shows that Case No. 33136 was assigned to Attorney Bowman's docket on May 22, 1992. GR 22, ¶ 40. Reasonable diligence can be shown if it is established that the attorney worked reasonably hard on the particular application in question during the continuous critical period. Bey v. Kollonitsch, 806 F.2d 1024, 1026, 231 USPQ 967, 969 (Fed. Cir. 1986).

Generally, the patent attorney must show that unrelated cases are taken up in chronological order, thus, the attorney has the burden of keeping good records of the dates when cases are docketed as well as the dates when specific work is done on the applications.

Kollonitsch, 806 F.2d at 1028, 231 USPQ at 970.

We have been directed to little evidence on the work done on the application in the period from December 7, 1992, (the day before Sugano filed in Japan) to the filing of the Geerts application. Geerts principally lies on patent attorney Bowman's testimony to establish diligence. Other than the date case No. 33136 was assigned to him and the filing date of the Geerts application. Bowman

provides little more than generalities and speculation as to his work on the application. Thus, he makes the following statements:

I do not recall any specific details of my efforts to prepare and ultimately file Case Number 33136 (the Phillips case that issued as the Geerts '180 patent) [GR 22, ¶ 40];

I probably did not begin any preliminary work on Case 33136 for at least several months after the Invention Committee's decision regarding IN 15174 [GR 22, ¶ 42]; .

I believe that I conducted preliminary work on Case 33136 starting after October 1992 [GR 23, ¶ 43]; and.

I believe that I began drafting Case 33136, following the ordinary sequence of cases appearing on my docket, sometime in early to mid 1993 [GR 23, ¶ 44].

Bowman testifies that he had a heavy case load between May 22, 1992, when Case No. 33136 was assigned to him, and August 31, 1993, well after the date that Geerts' application was filed. GR 22, ¶ 42; GR 24, ¶ 48. He also testifies that he took up cases in the order in which they were assigned to him. GR 22, ¶ 42. Reasonable diligence does not require that an attorney drop everything else and take up the preparation of an application on the involved invention. However, the evidence to which we have been directed is insufficient to prove that Geerts worked on the various matters assigned to him in chronological order except for necessary exigencies, such as responses to Office actions and statutory bar dates. The evidence does not establish the dates when specific work was done on the applications. Kollonitsch, 806 F.2d at 1028, 231 USPQ at 970.

Geerts specifically directs us to GX 69 and GX 70. These are said to be print outs of certain Phillips computer records covering the period from May 22, 1992, to August 31, 1993. These records are said to show, respectively, the applications and Office responses Bowman filed. GR 24, ¶ 48. These records appear to show only when the applications and Office responses were filed. No information is provided as when the work was actually done on the applications.

Geerts also refers to a chart which plots case numbers and the dates the corresponding applications were filed. However, the chart is apparently based on the data in GX 69. As such it does not show when Bowman actually worked on the cases. "[T]he attorney has the burden of

keeping good records of the dates when cases are docketed as well as the dates when specific work is done on the applications.” Kollonitsch, 806 F.2d at 1028, 231 USPQ at 970.

Bowman also testifies that during the same time period he worked on an application (Case No. 33120) directed to an invention “closely related” to the involved invention. GR 27, ¶ 54. Case No. 33120 was apparently assigned to the boroxine invention and ultimately became the 061 patent. GR 27, ¶ 54. Work on a related case may be credited toward reasonable diligence if the work on the related case "contribute[s] substantially to the ultimate preparation of the involved application." Kollonitsch, 806 F.2d at 1029, 231 USPQ at 970. Geerts has not explained how the work on the 33120 application contributed substantially to the preparation of Geerts’ involved application. Bowman merely states the conclusion that the cases are closely related and that much of the work from 33120 carried over to the preparation of 33136. GR 27, ¶ 54. What that work was has not been identified.

Geerts has failed to prove the dates when activity specific to the Geerts involved application occurred. Geerts has failed to show attorney diligence from a time prior to the filing of Sugano’s Japanese application on December 8, 1992, to the filing of Application 08/092,143 on July 14, 1993.

FINAL JUDGMENT

It is

ORDERED that judgment on priority as to the subject matter of Count 1 (Paper 42, p.4), is awarded against the junior party, ROLF L. GEERTS and TARA G. HILL;

FURTHER ORDERED that junior party, ROLF L. GEERTS and TARA G. HILL, is not entitled to a patent containing Claims 1-9, 14, 19-27, 30-32 (corresponding to Count 1) of U.S. Patent 5,414,180;

FURTHER ORDERED that if there is a settlement agreement that the parties are advised of the requirement to file a copy of the agreement (35 U.S.C. § 135(c)); and

FURTHER ORDERED that a copy of this judgment is made of record in Application 08/887,265 and in the file history of Patent 5,414,180.

RICHARD E. SCHAFER

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Administrative Patent Judge)	
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)	BOARD OF PATENT
JAMESON LEE)	
Administrative Patent Judge)	APPEALS AND
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